Up To Date

NASA IV&V Program
Educator Resource Center Newsletter

September 2011

Inside this issue:

ERC Student Robotic Workshop

Students then travelled to the Research Center building, also in the I-79 Technology Park where the IV&V ERC is located. There, Dr. Thomas Evans, Program Manager for the WVU-NASA Robotic Arm Program presented an overview of the Center for the Robotic Servicing of Orbital Space Assets which has been established by WVU as part of a cooperative partnership with NASA.

Sand Fork Elementary School 6th grade students came to the ERC for the first student workshop of the year. Led by Amy Phillips, Graduate Assistant in charge of Student Programming, they were introduced to robotics with activities in the main ERC lab and in the new Student Research Lab where they used the NXT robots with robotic arms attached to accomplish certain challenges.

NASA IV&V's own Steve Driskell spoke to the students about projects he had worked on relating to NASA robotics.

The center has a variety of robotic arms and is working on grappling and docking with satellites in geosynchronous orbit of Earth. This would allow the satellites to be serviced when problems develop - something that at present is not possible because these satellites are much farther from Earth then the ISS or Hubble Telescope. solutions are now being investigated here in WV that will allow this type of satellite to be repaired.

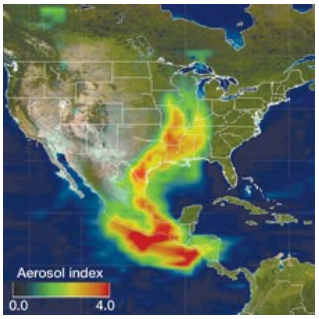
Upper left photo: Students programming robots in the Student Research Lab at the ERC

Below: Students with Dr. Tom Evans and Amy Phillips at the WVU-NASA Robotics lab

Upcoming GLOBE Workshop

On Oct. 28-30th the ERC will host a ***spooktacular*** GLOBE workshop on Atmosphere!

Over the last 8 years, the West Virginia GLOBE partnership has conducted almost 100 workshops for 720 teachers from 368 schools. These educators received the training and tools to help their students become engaged in measuring our local environment so that they may better understand our global climate. This workshop will focus on several atmospheric protocols that have particular relevance to understanding Earth's energy budget including: Clouds and Contrails, Aerosols, and Surface Temperature. 18 educators from across WV, PA, MD, and VA will learn about local and global impact of fires, dust, and particulates and how their students can join the annual Surface Temperature Field Campaign. The workshop is being led by Todd Ensign (IV&V), Jessica Taylor (NASA Langley),



Paul Allen (Fort Hayes State University), and Kevin Czajkowski (University of Toledo). Lodging, meals, substitute fees, and the guest speakers are provided by the NASA IV&V Program and equipment is being partially donated by NASA Goddard Space Flight Center. All participants will receive a handheld GPS unit, Infrared Thermometer (and possibly a sun photometer if they can be hand-built in time).

Research Laboratory Named for Capt. Jon McBride

Jon McBride, West Virginia's only NASA astronaut, was honored September 23, with the naming of NASA IV&V's new research laboratory in his honor. J-STAR (Jon McBride Software Testing and Research Laboratory) provides software testing and simulation capabilities on mission and safety critical system software for missions from such places as Goddard Space Flight Center, Wallops Flight Facility, Johnson Space Center and the Jet Propulsion Laboratory in California.

What does this really mean? Three examples of what IV&V has done and is doing:

- Worked on International Space Station mission – critical software
- Worked on Hubble Space Telescope instrumentation software
- Is analyzing critical software behaviors associated with the new James Webb Space telescope

At any given time IV&V is working on approximately twenty NASA missions in a software verification and validation process.

The J-STAR Laboratory will enhance IV&V's ability to provide software services to the space industry and will help expand the customer base IV&V serves.

At the ceremony, Jon McBride recounted that he had built model rockets and airplanes while growing up in Raleigh County but had never flown in an airplane until one fateful day, when as a college student, he was sitting in the Mountainlair student union at WVU and a Navy recruiter walked by asking if anyone wanted a ride in an airplane. The rest is a history of dreams coming true. He was a successful Navy pilot for many years and then applied for the first Space Shuttle Astronaut class. As part of the process he was asked to write a one page paper about why he wanted to be an astronaut. He concluded his list of reasons with a one liner that had the interview committee smiling— "besides WV hasn't had a hero since Jerry West!"

Above photo: Jon McBride, WV astronaut, accepts JSTAR dedication plaque from Greg Blaney, NASA IV&V Program director

As a NASA astronaut one of his accomplishments was being the pilot of the Space Shuttle Challenger's STS 41-G mission. On board were seven crew members—the largest flight crew ever to fly on a single spacecraft at that time.

Today, Capt. McBride is retired from the Navy but continues to represent NASA as part of the astronaut speaker program while also running his own business.

Upcoming ERC Workshops and Events

Oct. 6 Living and Working in Space –Student workshop 11:00 AM

Oct. 7 Robots and Ratios 8-2 PM

Oct. 11 Model Rocketry Student Workshop 11:00 AM

Oct. 11 Basic Rocketry 5-8 PM

Oct. 15 NASA Engineering Design Challenge (Webinar) 11 AM

Oct. 22 Model Rocketry ERC 10-4 PM

Oct. 25 Living and Working in Space—Student workshop 11 AM

Oct. 27 Robotics Exploration/WeDo's ERC 4-8 PM

Oct. 28-30 GLOBE Train the Trainers Workshop

Nov. 1 Planetary Geology—Student Workshop 11:00 AM

Nov. 3-5 WV Science Teachers Conference at Flatwoods

Nov. 8 Electromagnetic Spectrum - Student Workshop

Nov. 9 Fascinating Flight 5-8 PM

Nov. 15 Making the Invisible Detectable 5-8 PM

Dec. 7 Plants in space: Hydroponics and Lunar Chambers 5-8 PM

Dec. 13 Kindernauts, Echo the Bat, Amelia the Pigeon 4-7 PM

NASA, NASCAR, and Racing

ERC intern, Josh Revels, enjoys racing

How have NASA explorations helped the NASACAR drivers and fans? Check out these few examples!

A chemically treated fabric that won't burn or give off fumes was developed by NASA to protect astronauts. It's now used to make suits for race car drivers and pit crews.

NASA developed sealing gaskets to stand up under the extreme conditions of space flight. They keep car engine oil clean, increasing the life of the vehicle.

A plasma spray coating eliminates the need for liquid lubricants in certain engines. The NASA technology may lead to lighter, cheaper, and more efficient compact cars.

NASA's search for heat-tolerant space materials led to composite materials for brake linings that wear longer, cost less, and stand up under friction temperatures of up to 650 degrees.

A strain gauge had its start on a mobile robot developed for NASA; it detected destructive forces on the robot's frame. The gauge now measures strain on racing car suspension systems.

Using a process developed at NASA for handling launch vehicle fuels, nearly 5,000 tires per day can be recycled into asphalt roadbeds, new tires, and hoses.

Inorganic paint protects the hot parts of automobiles like exhaust systems, brake drums, firewalls, and engine manifolds. The paint was developed from NASA technology.

A gas leak detection system developed to monitor the Shuttle's hydrogen propulsion system is now being used by automakers to build natural-gas-powered cars.

Space flight research on how and why things burn has helped scientists' efforts to find other fuels, like hydrogen, for engines and furnaces. The research has already begun to show up in improved jet engines and could soon lead to cleaner-burning cars.

Materials from the Space Shuttle's thermal protection system are used on race cars to protect drivers from the extreme heat generated by the engines. Without the insulation, the temperature can reach 160 degrees inside some vehicles.

For an interactive website that features NASA and NASCAR: http://www.nasa.gov/externalflash/Rockets2Racecars/

For more information on how NASA impacts everyday life: http://www.nasa.gov/externalflash/nasacity/index2.htm Here is everything from interactive kitchens and bathrooms to airplanes that highlight NASA discoveries that make our everyday life more enjoyable.

West Virginia Science Teachers

As an organization, WVSTA is keenly interested in advocating for best practices in science education - those practices which enhance the lives of our students and promote scientific literacy among them. WVSTA takes an activist role in seeing that such practices be broadly adopted and supported across West Virginia.

WVSTA is a statewide organization that has provided for or supported many of the professional development needs of teachers of science in West Virginia for 20 years. Starting from humble beginnings with 60 motivated science teachers in 1985, our organization has grown into the forum for science education reform in West Virginia, including the development of regional Science-Mathematics Consortia all over the state. Our members include Early Childhood, Elementary, Middle School, High School and College teachers as well as Informal Education, Business and Technical Professionals.

Members of WVSTA are leaders in the field of science teaching. Many members have gone on to receive National Board of Professional Teaching Standards Certification, Presidential Awards for Excellence in Science Teaching and Milken Family Foundation Awards

Other members have gone on to represent West Virginia in other professional organizations, such as the National Association of Geosciences Teachers, the American Chemical Society, and the Science Association for Students with Disabilities.

Many members have also served on statewide committees that address science curriculum standards and materials, and assessment practices. As a result of our broad constituency and demonstrated excellence of our members, WVSTA is well positioned to represent the breadth and depth of science education in West Virginia. *(adapted from the WVSTA website)*

The WVSTA annual conference will be Nov. 3-5 at Flatwoods Conference Center. Highlights include the annual auction with WVSTA bucks, great workshops for all grade levels, guest speakers –Dr. Steve Brooks, NOAA atmospheric scientist, and Dr. Dixon Butler, physicist, educator, policy maker, - and great fun!

To register visit :

www.wvsta.org

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ERC Website: http://erc.ivv.nasa.gov

The NASA Independent Verification and Validation Program Educator Resource Center's goal is to serve teachers, informal educators, and pre-service teachers to enable them to reach their goals. Through a grant with Fairmont State University, the NASA IV&V Program ERC provides materials, equipment for loan, and professional development workshops for informal and formal educators both at the facility and around the state of West Virginia that reflect NASA's current research and technology.

Links to Student Competitions

First Lego League Robotics:

http://www.firstlegoleague.org/

Real World Design Challenge:

http://www.realworlddesignchallenge.org/

Team America Rocketry Challenge:

http://rocketcontest.org/

Green Aviation Contests:

http://aero.larc.nasa.gov/competitions.htm

Workshop Comments of the Month:

Wonderful Job! I can't wait to use the ideas presented for lessons and for using the STARLAB.

The presentation was easy to follow and taught me so many concepts!

I definitely plan to take more workshops!

Science Quote of the Month:

" **The most beautiful experience we can have is the mysterious. It is the fundamental emotion which stands at the cradle of true art and true science. Albert Einstein**

Where in WV is the ERC?

September Workshops in Red

September Equipment Loans in Blue

To schedule a workshop:

Contact the ERC by calling 304-367-8436 or emailing:

pamela.casto@ivv.nasa.gov

To schedule equipment for loan: First, check the equipment loan calendar on the ERC website to see if the equipment is available for the dates desired. Then choose your dates (up to a two week loan period) and email Josh Revels who will schedule the loan.

josh.revels@ivv.nasa.gov